Ecological, Political and Social Ramifications of Prescribed Fire Restoration in East Texas Pineywoods Ecosystems: A Case Study

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The effectiveness of prescribed burning for ecological restoration of forests in three East Texas state parks, and visitor attitudes concerning prescribed burning were evaluated. Fuel loads and vegetation were monitored at Mission Tejas, Tyler, and Village Creek State Parks. Surveys were conducted during summer 1999 and 2000 with burning conducted in early spring 2000.

Overstories at the parks consisted of mixed broadleaf with either shortleaf (*Pinus echinata* Mill.), loblolly (*Pinus taeda* L.) or longleaf pine (*Pinus palustris* Mill.). All stands showed signs of degradation due to fire exclusion. Mid- and understories at all parks consisted of dense shrubs, vines, forbs, sedges and grasses.

Primary objectives of initial burns were to reintroduce fire into the ecosystems and reduce fuel loads. Other objectives included reducing wildfire risk, reducing midstory shrubs and saplings, increasing herbaceous species, enhancing diversity, improving wildlife habitat, and encouraging longleaf pine seedlings at Village Creek State Park (Robinson and Blair 1997; Sparks 1999a; Sparks 1999b).

Prolonged drought resulting in county burn bans prohibited burning until bans were temporarily lifted following rain episodes. Due to the necessity to wait until a rain event, resulting burns were weak.

Results indicated no effect from the burns in the overstory, seedling, shrub or herbaceous layers. At both Tyler and Village Creek, T-tests indicated a significant increase in percent of dead standing saplings in the burn plots from 1999 to 2000 ($t = 3.004$, $P = 0.003$, and $t = 2.286$, $P = 0.023$ respectively). This illustrated the cumulative effect of the drought and the burn. Morisita's similarity index illustrated high similarity in seedling, shrub and herbaceous communities from 1999 to 2000 (Morisita 1959).

There were no significant changes in dead and downed woody fuels. Combined weight of O_i and O_e horizons decreased significantly, 0.98 Mg ha^{-1}, ($t = 5.182$, $P < 0.001$) in the burn plots. There was also a statistically significant decrease in depth of O_i and O_e combined in the burn plots ($t = 2.074$, $P < 0.05$), while the control plots exhibited a significant increase ($t = -6.641$, $P < 0.001$).

A visitors' survey indicated support for forest and wildlife management in general. Although 70 percent agreed that wildfires should be prevented in the parks, they disagreed that some fire is necessary for the health of certain forests. Over half the respondents agreed that prescribed burning and wildfire have the same impact, and that prescribed burning should not be used as a management tool in parks. These results indicate a need for education concerning differences between wild and prescribed fire, benefits of prescribed fire, and its usefulness in preventing wildfires.

In Texas, county judges are responsible for issuing burn bans, but they can also authorize a burn during a ban. A relationship should be fostered between Texas Parks and Wildlife Department and county judges. After being informed, judges should be able to understand the importance of fire on the landscape, and the precautions taken to keep prescribed burns contained.

In this case, it appears the burns did not fully reach objectives concerning fuel loads and vegetation. Under natural conditions, these parks would have burned during dry periods. To be forced to adhere to burn bans reduces the restorative powers of prescribed burning.

Literature Cited

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